

1 1. A display controller for providing a luminance value to a display comprising:
2
3 an original gamma correction mapping table containing entries describing
4 a default luminance value to be provided said display for a magnitude
5 of a video input signal;
6
7 a gamma correction transform circuit in communication with the original
8 gamma correction mapping table to receive said entries and connected
9 to receive a contrast signal and a brightness signal and from said
10 contrast signal and brightness signal transform said entries to
11 transformed luminance values; and
12
13 a transformed gamma correction mapping table in communication with the
14 gamma correction transform circuit to receive the transformed
15 luminance values, said gamma correction mapping table connected to
16 receive a video signal whereby said video signal provides a pointer to
17 said luminance values.

1 2. The display controller of claim 1 wherein the gamma correction transform circuit
2 executes the function:

3
$$G_new(i) = G_orig((i * a) + b)$$

4 where:

5 i is a counter representing potential magnitude values of the
6 video signal,

7 $G_new(i)$ is the transformed value of the luminance value for an
8 i th magnitude,

9 a is a magnitude of the contrast signal, and

10 b is a magnitude of the brightness signal.

1 3. The display controller of claim 1 wherein the gamma correction transform circuit
2 executes the function:

3
$$G_new(i) = G_orig(C_i)$$

4 where:

5
$$\begin{array}{l|l} C_i = b & i = 0 \\ C_i = C_{i-1} + a & i > 0 \end{array}$$

6 C_i is a pointing variable to the luminance values in the original
7 gamma correction mapping table,

8 i is a counter representing potential magnitude values of the
9 video signal,

10 a is a magnitude of the contrast signal, and

11 b is a magnitude of the brightness signal.

1 4. The display controller of claim 1 wherein the gamma correction transform circuit
2 is a microcontroller.

1 5. The display controller of claim 4 wherein the microcontroller executes a program
2 process that performs the function:

3
$$G_new(i) = G_orig((i * a) + b)$$

4 where:

5 *i* is a counter representing potential magnitude values of the
6 video signal,

7 *G_{new}(i)* is the transformed value of the luminance value for an
8 *i*th magnitude,

9 *a* is a magnitude of the contrast signal, and

10 *b* is a magnitude of the brightness signal.

1 6. The display controller of claim 4 wherein the microcontroller executes a program
2 process that performs the function:

3
$$G_new(i) = G_orig(C_i)$$

4 where:

$$\begin{array}{l} C_i = b \quad | i = 0 \\ C_i = C_{i-1} + a \quad | i > 0 \end{array}$$

C_i is a pointing variable to the luminance values in the original gamma correction mapping table,

i is a counter representing potential magnitude values of the video signal,

a is a magnitude of the contrast signal, and

b is a magnitude of the brightness signal.

7. The display controller of claim 4 wherein the original gamma correction mapping table is digital data stored in a memory.

8. The display controller of claim 7 wherein the transformed gamma correction mapping table is digital data stored in the memory.

9. A display control system for providing luminance values to a display comprising:

a microcontroller connected to receive a video signal, a contrast signal, and a brightness signal; and

a memory in communication with the microcontroller to retain default gamma correction data and transformed gamma correction data;

said microcontroller executing a program process comprising the steps of:

7 receiving a new contrast signal,
8 receiving a new brightness signal,
9 testing if the new contrast signal and the new brightness signal
10 are respectively equivalent to a default contrast signal and a
11 default brightness signal,
12 if the new contrast signal is equivalent to the default contrast
13 signal and the brightness signal is equivalent to the default
14 brightness signal, designating the default gamma correction
15 mapping table for determining a luminance value for said
16 display,
17 if the new contrast signal is not equivalent to the default contrast
18 signal and/or the brightness signal is not equivalent to the
19 default brightness signal, transforming the default gamma
20 correction mapping table as a function of the contrast signal
21 and the brightness signal,
22 storing the transformed gamma correction mapping table to the
23 memory, and
24 if the new contrast signal is equivalent to the default contrast
25 signal and the brightness signal is equivalent to the default
26 brightness signal, mapping the video signal to determine the

27 luminance level from the default gamma correction mapping
28 table,

29 if the new contrast signal is not equivalent to the default contrast
30 signal and/or the brightness signal is not equivalent to the
31 default brightness signal, mapping the video signal to
32 determine the luminance level from the transformed gamma
33 correction mapping table,

34 generating a luminance signal from the luminance level, and

35 transferring the luminance signal to the display.

1 10. The display control system of claim 9 wherein the function is:

2
$$G_new(i) = G_orig((i * a) + b)$$

3 where:

4 i is a counter representing potential magnitude values of the
5 video signal,

6 $G_new(i)$ is the transformed value of the luminance value for an
7 i th magnitude,

8 a is a magnitude of the contrast signal, and

9 b is a magnitude of the brightness signal.

1 11. The display control system of claim 9 wherein the function is:

2
$$G_new(i) = G_orig(C_i)$$

3 where:

4
$$\begin{array}{l|l} C_i = b & i = 0 \\ C_i = C_{i-1} + a & i > 0 \end{array}$$

5 C_i is a pointing variable to the luminance values in the original
6 gamma correction mapping table,

7 i is a counter representing potential magnitude values of the
8 video signal,

9 a is a magnitude of the contrast signal, and

10 b is a magnitude of the brightness signal.

1 12. A method for providing luminance value to a display comprising the steps of:

2 receiving a new contrast signal,

3 receiving a new brightness signal,

4 testing if the new contrast signal and the new brightness signal
5 are respectively equivalent to a default contrast signal and a
6 default brightness signal,

7 if the new contrast signal is equivalent to the default contrast
8 signal and the brightness signal is equivalent to the default
9 brightness signal, designating the default gamma correction
10 mapping table for determining a luminance value for said
11 display,

12 if the new contrast signal is not equivalent to the default contrast
13 signal and/or the brightness signal is not equivalent to the
14 default brightness signal, transforming the default gamma
15 correction mapping table as a function of the contrast signal
16 and the brightness signal,

17 storing the transformed gamma correction mapping table to the
18 memory, and

19 if the new contrast signal is equivalent to the default contrast
20 signal and the brightness signal is equivalent to the default
21 brightness signal, mapping the video signal to determine the
22 luminance level from the default gamma correction mapping
23 table,

24 if the new contrast signal is not equivalent to the default contrast
25 signal and/or the brightness signal is not equivalent to the
26 default brightness signal, mapping the video signal to

27 determine the luminance level from the transformed gamma
28 correction mapping table,

29 generating a luminance signal from the luminance level, and

30 transferring the luminance signal to the display.

1 13. The method of claim 12 wherein the function is:

2
$$G_new(i) = G_orig((i * a) + b)$$

3 where:

4 *i* is a counter representing potential magnitude values of the
5 video signal,

6 *G_new(i)* is the transformed value of the luminance value for an
7 *i*th magnitude,

8 *a* is a magnitude of the contrast signal, and

9 *b* is a magnitude of the brightness signal.

1 14. The method of claim 12 wherein the function is:

2
$$G_new(i) = G_orig(C_i)$$

3 where:

$$\begin{array}{l|l} C_i = b & i = 0 \\ C_i = C_{i-1} + a & i > 0 \end{array}$$

C_i is a pointing variable to the luminance values in the original gamma correction mapping table,

i is a counter representing potential magnitude values of the video signal,

a is a magnitude of the contrast signal, and

b is a magnitude of the brightness signal.

15. An apparatus for providing luminance value to a display comprising the steps of:

means for receiving a new contrast signal,

means for receiving a new brightness signal,

means for testing if the new contrast signal and the new

brightness signal are respectively equivalent to a default

contrast signal and a default brightness signal,

means for designating the default gamma correction mapping

table for determining a luminance value for said display, if

the new contrast signal is equivalent to the default contrast

signal and the brightness signal is equivalent to the default

brightness signal,

12 means for transforming the default gamma correction mapping
13 table as a function of the contrast signal and the brightness
14 signal, if the new contrast signal is not equivalent to the
15 default contrast signal and/or the brightness signal is not
16 equivalent to the default brightness signal,

17 means for storing the transformed gamma correction mapping
18 table to the memory, and

19 means for mapping the video signal to determine the luminance
20 level from the default gamma correction mapping table, if the
21 new contrast signal is equivalent to the default contrast
22 signal and the brightness signal is equivalent to the default
23 brightness signal,

24 means for mapping the video signal to determine the luminance
25 level from the transformed gamma correction mapping table,
26 if the new contrast signal is not equivalent to the default
27 contrast signal and/or the brightness signal is not equivalent
28 to the default brightness signal,

29 means for generating a luminance signal from the luminance
30 level, and

31 means for transferring the luminance signal to the display.

16. The apparatus of claim 15 wherein the function is:

$$G_new(i) = G_orig((i * a) + b)$$

where:

i is a counter representing potential magnitude values of the video signal,

$G_new(i)$ is the transformed value of the luminance value for an i th magnitude,

a is a magnitude of the contrast signal, and

b is a magnitude of the brightness signal.

17. The apparatus of claim 15 wherein the function is:

$$G_new(i) = G_orig(C_i)$$

where:

$$\begin{array}{l|l} C_i = b & i = 0 \\ C_i = C_{i-1} + a & i > 0 \end{array}$$

C_i is a pointing variable to the luminance values in the original gamma correction mapping table,

i is a counter representing potential magnitude values of the video signal,

a is a magnitude of the contrast signal, and

b is a magnitude of the brightness signal.

18. A medium for retaining a computer program which, when executed on a computing system, executes process for providing luminance value to a display comprising the steps of:

receiving a new contrast signal,

receiving a new brightness signal,

testing if the new contrast signal and the new brightness signal are respectively equivalent to a default contrast signal and a default brightness signal,

if the new contrast signal is equivalent to the default contrast signal and the brightness signal is equivalent to the default brightness signal, designating the default gamma correction mapping table for determining a luminance value for said display,

if the new contrast signal is not equivalent to the default contrast signal and/or the brightness signal is not equivalent to the

16 default brightness signal, transforming the default gamma
17 correction mapping table as a function of the contrast signal
18 and the brightness signal,

19 storing the transformed gamma correction mapping table to the
20 memory, and

21 if the new contrast signal is equivalent to the default contrast
22 signal and the brightness signal is equivalent to the default
23 brightness signal, mapping the video signal to determine the
24 luminance level from the default gamma correction mapping
25 table,

26 if the new contrast signal is not equivalent to the default contrast
27 signal and/or the brightness signal is not equivalent to the
28 default brightness signal, mapping the video signal to
29 determine the luminance level from the transformed gamma
30 correction mapping table,

31 generating a luminance signal from the luminance level, and

32 transferring the luminance signal to the display.

1 19. The medium of claim 18 wherein the function is:

2
$$G_new(i) = G_orig((i * a) + b)$$

3 where:

4 *i* is a counter representing potential magnitude values of the
5 video signal,

6 ***G_{new}(i)*** is the transformed value of the luminance value for an
7 *i*th magnitude,

8 *a* is a magnitude of the contrast signal, and

9 *b* is a magnitude of the brightness signal.

1 20. The medium of claim 18 wherein the function is:

2 **$G_{new}(i) = G_{orig}(C_i)$**

3 where:

4 **$$\begin{array}{l|l} C_i = b & i = 0 \\ C_i = C_{i-1} + a & i > 0 \end{array}$$**

5 ***C_i*** is a pointing variable to the luminance values in the original
6 gamma correction mapping table,

7 *i* is a counter representing potential magnitude values of the
8 video signal,

9 *a* is a magnitude of the contrast signal, and

10

b is a magnitude of the brightness signal.

- 1 21. The medium of claim 18 wherein said medium is selected from the program
- 2 storage medium consisting of random access memory, read only memory,
- 3 magnetic storage devices, and optical storage devices.